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capability of restructurable VLSI which allows a chip to be customized after fabrication. We give a linear-area chip of m process ...

144 Automated partitioning of hierarchically specified digital systems

Thomas S. Payne, W. M. vanCleemput

January 1982 Proceedings of the 19th conference on Design automation

Full text available:  pdf (794.27 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes a heuristic algorithm for automatically partitioning digital systems. High level information contained within a hierarchical design is used to increase the effectiveness of this algorithm. This algorithm uses a constructive process to build a physical design of a hierarchically specified logic design. An iterative improvement step is then done.

145 A minimum-impact routing algorithm

Kenneth J. Sunowit

January 1982 Proceedings of the 19th conference on Design automation

Full text available:  [pdf \(695.70 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A routing heuristic is presented that routes two-terminal nets one at a time, for each net choosing the path so as to avoid adversely impacting the nets not yet routed. An algorithm is presented and proved to correctly implement this heuristic; the computational complexity of that algorithm is shown to be polynomially bounded, but perhaps still too great to be of practical use. Another, speedier algorithm is presented that seems to approximate the heuristic rather closely. Strong evidence is ...

146 A symbolic design system for integrated circuits

K. H. Keller, A. R. Newton, S. Ellis

January 1982 Proceedings of the 19th conference on Design automation

Full text available: pdf (828.20 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

As integrated circuit design has become increasingly complex, the need for more effective data description techniques has become critical. Design verification from mask artwork data alone can consume vast amounts of computer time for VLSI circuits, if it can be performed at all. The use of a symbolic design description, which allows the designer or synthesis program to express circuit structure as well as maintain full connectivity information, can reduce dramatically the burden placed on the designer.

147 Experiments using interactive color raster graphics for CAD

Abe Shliferstein

January 1982 Proceedings of the 19th conference on Design automation

Full text available: [pdf \(1.14 MB\)](#) **Additional Information:** [full citation](#), [abstract](#), [references](#), [index terms](#)

Color raster graphics is being incorporated into CAD systems for printed circuit board (PCB) design. An interactive prototype CAD system developed as an experimental base is described, along with color graphics research using this prototype. Areas investigated included the generation and display of complex PCB's, the display of depth information using "2 1/2 dimensional" techniques, performance measurements on color raster systems, possibilities for new on-line design audit tech ...

148 Testing and Debugging Custom Integrated Circuits

Edward H. Frank, Robert F. Sproull

December 1981 ACM Computing Surveys (CSUR), Volume 13 Issue 4

Full text available: pdf(2.25 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

149 Graphics language / one - IBM Corporate-Wide physical design data format

David R. Lambert

June 1981 **Proceedings of the 18th conference on Design automation**

Full text available: pdf(392.15 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The evolution and structure of the IBM Corporate-Wide physical design data language, GL/1 (Graphics Language / One), is discussed. The need for a common graphics interface for communication among various design automation programs is demonstrated. At IBM, the same format is used from physical layout to mask generation for integrated circuit and printed circuit board designs.

150 A parallel bit map processor architecture for DA algorithms

Tom Blank, Mark Stefk, Willem vanCleempunt

June 1981 **Proceedings of the 18th conference on Design automation**

Full text available: pdf(748.21 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Bit maps have been used in many Design Automation (DA) algorithms such as printed circuit board (PCB) layout and integrated circuit (IC) design rule checking (DRC). The attraction of bit maps is that they provide a direct representation of two-dimensional images. The difficulty with large scale use of bit maps (e.g., for DRC on VLSI) is that the large amounts of data can consume impractical amounts of computation on sequential machines. This paper describes a processing architect ...

151 Government interest and involvement in design automation development the VHSIC perspective

Larry W. Sumney

June 1981 **Proceedings of the 18th conference on Design automation**

Full text available: pdf(232.37 KB) Additional Information: [full citation](#), [abstract](#), [index terms](#)

This paper describes the VHSIC Program and seeks to delineate the challenges for design automation which are vital to the Program's success. More than one-half of the VHSIC Program will focus on design architecture, software, and test. Because of the extreme importance of advanced militarized integrated circuits to our defense posture, alternatives to controlling the premature export of circuits, equipment, and technical data will be briefly reviewed. Finally, the opportunity to synergistic ...

152 Structured machine design: An ongoing experiment

Richard F. Hobson

May 1981 **Proceedings of the 8th annual symposium on Computer Architecture**

Full text available: pdf(872.83 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In the following sections, the needs of structured architecture from the point of view of a single-user HLLCS is discussed. A prototype machine is introduced, and its design is treated as an ongoing experiment in structured machine design. This approach is relevant because historical evidence suggests that computer architecture (hardware and software) evolves slowly, requiring valuable information obtained through everyday use.

153 The cube-connected cycles: a versatile network for parallel computation

Franco P. Preparata, Jean Vuillemin

May 1981 **Communications of the ACM**, Volume 24 Issue 5

Full text available:  pdf(996.20 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

An interconnection pattern of processing elements, the cube-connected cycles (CCC), is introduced which can be used as a general purpose parallel processor. Because its design complies with present technological constraints, the CCC can also be used in the layout of many specialized large scale integrated circuits (VLSI). By combining the principles of parallelism and pipelining, the CCC can emulate the cube-connected machine and the shuffle-exchange network with no significant degradation ...

Keywords: Fourier transform, VLSI design, parallel processing, sorting

154 Detecting bridging and stuck-at faults at input and output pins of standard digital components

Mark Karpovsky, Stephen Y.H. Su

June 1980 **Proceedings of the 17th conference on Design automation**

Full text available:  pdf(904.10 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Due to the advances in the integrated circuit technology, there is an increasing importance in testing bridging (short circuit) failures in digital networks. Unfortunately, very little work has been done in this area. This paper presents the schemes for the detection of feedback bridgings between the inputs and outputs through the observation of oscillation and asynchronous behavior of sequential networks created by bridging faults. The lower and upper bounds on the number of tests for dete ...

155 An IC design station needs a high performance color graphic display

Neil Weste, Bryan Ackland

June 1980 **Proceedings of the 17th conference on Design automation**

Full text available:  pdf(537.97 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Raster-scan color graphic displays provide increased visual feedback in many CAD areas. In addition the unique architecture of displays used for this purpose enable other CAD related problems to be solved within the hardware structure of the display. Achieving these features commensurate with human response times requires new architectures and algorithm development for color displays. This paper presents the architecture and some of the algorithms used in an advanced color display ...

156 Practical automated design of LSI for large computers

J Philip Singleton, Nigel R Crocker

June 1980 **Proceedings of the 17th conference on Design automation**

Full text available:  pdf(361.53 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The design of large computers using LSI techniques requires relatively large numbers of different designs in relatively small quantities. The paper describes a system of designing integrated circuits rapidly and reliably in this environment using the Uncommitted Logic Array (Master Slice) approach. An integrated design, validation and production system has been developed from logical input to pattern generator tape production which takes away the need for knowledge of Silicon Layout techniq ...

157 The PUMA project: Computer design automation in the university

Ralph Grishman

January 1980 **Proceedings of the ACM 1980 annual conference**

Full text available: pdf(687.80 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We shall describe in this paper a project in the New York University Computer Science Department which over the past few years has designed and built a series of high-speed scientific computer systems. These systems have been dubbed PUMA Computers (for Processing Unit with Microprogrammed Arithmetic). A major emphasis throughout this project has been on computer-aided design, manufacture, and testing.

158 The LASS hardware processor

Paul F. Kunz, Richard N. Fall, Michael F., Hanoch Brafman

November 1978 **Proceedings of the 11th annual workshop on Microprogramming**

Full text available: pdf(591.25 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The problems of data analysis with hardware processors are reviewed and a description is given for a programmable processor. This processor, the 168/E, has been designed for use in the LASS multi-processor system; it has an execution speed comparable to that of the IBM 370/168 and uses the subset of IBM 370 instructions appropriate to the LASS analysis task.

159 Microprogrammed implementation of a single chip microprocessor

Skip Stritter, Nick Tredennick

November 1978 **Proceedings of the 11th annual workshop on Microprogramming**

Full text available: pdf(750.84 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper considers microprogramming as a tool for implementing large scale integration, single-chip microprocessors. Design trade-offs for microprogrammed control are discussed in the context of semiconductor design constraints which limit the size, speed, complexity and pin-out of circuits. Aspects of the control unit of a new generation microprocessor, which has a two level microprogrammed structure, are presented.

160 A color graphics system for I.C. mask design and analysis

N. Weste

June 1978 **Proceedings of the 15th conference on Design automation**

Full text available: pdf(690.67 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In view of the continuing requirement for good interactive tools in the area of computer aided design, an advanced high-resolution monochrome and color, mini-computer controlled, graphics display has been designed and built. Considering the particular area of integrated circuit mask design, the ability to produce filled, color coordinated shapes extends the designer's interpretation of displayed layouts to a level not previously available with conventional graphics displays. Apart from this ...

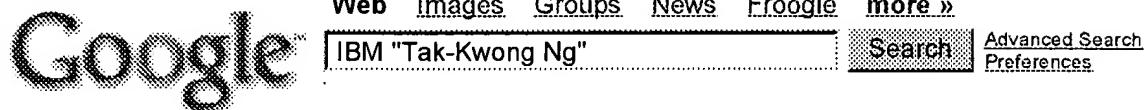
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Tak-Kwong Ng* - S. Lennart Johnsson" Q IBM Corp., Poughkeepsie, NY, 12602 ** Yale ...

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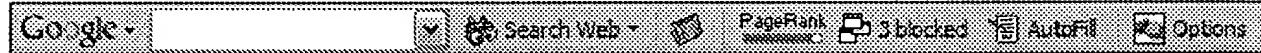
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